

length are replaced, they shall be replaced with bolts that have telltale holes $\frac{3}{16}$ inch to $\frac{7}{32}$ inch in diameter and at least $1\frac{1}{4}$ inches deep at each end, or that have telltale holes $\frac{3}{16}$ inch to $\frac{7}{32}$ inch in diameter their entire length. At the time of replacement of broken staybolts, adjacent staybolts shall be inspected.

(c) *Assessment of broken staybolts.* Telltale holes leaking, plugged, or missing shall be counted as broken staybolts.

(d) *Prohibited methods of closing telltale holes.* Welding, forging, or riveting broken staybolt ends is prohibited as a method of closing telltale holes.

§ 230.40 Time and method of staybolt testing.

(a) *Time of hammer testing*—(1) General. All staybolts shall be hammer tested at every 31 service day inspection, except as provided in paragraph (a)(2) of this section. All staybolts also shall be hammer tested under hydrostatic pressure any time hydrostatic pressure above the MAWP specified on the boiler specification form (FRA Form No. 4), is applied to the boiler. (See appendix B of this part.)

(2) Exception for inaccessible staybolts. The removal of brickwork or grate bearers for the purpose of hammer testing staybolts during each 31 service day inspection will not be required if the staybolts behind these structural impediments have a telltale hole $\frac{3}{16}$ inch to $\frac{7}{32}$ inch in diameter their entire length. Whenever the brickwork or grate bearers are removed for any other reason, however, the bolts shall be inspected at that time.

(b) *Method of hammer testing.* If staybolts are tested while the boiler contains water, the hydrostatic pressure must be not less than 95 percent of the MAWP. The steam locomotive owner and/or operator shall tap each bolt with a hammer and determine broken bolts from the sound or the vibration of the sheet. Whenever staybolts are tested while the boiler is not under pressure, such as during the 31 service day inspection, the staybolt test must be made with all the water drained from the boiler.

§ 230.41 Flexible staybolts with caps.

(a) *General.* Flexible staybolts with caps shall have their caps removed during every 5th annual inspection for the purpose of inspecting the bolts for breakage, except as provided in paragraph (b) of this section.

(b) *Drilled flexible staybolts.* For flexible staybolts that have telltale holes between $\frac{3}{16}$ inch and $\frac{7}{32}$ inch in diameter, and which extend the entire length of the bolt and into the head not less than one third of the diameter of the head, the steam locomotive owner and/or operator need not remove the staybolt caps if it can be established, by an electrical or other suitable method, that the telltale holes are open their entire length. Any leakage from these telltale holes during the hydrostatic test indicates that the bolt is broken and must be replaced. Before the steam locomotive is placed in service, the inner ends of all telltale holes shall be closed with a fireproof porous material that will keep the telltale holes free of foreign matter and permit steam or water to exit the telltale hole when the bolt is broken or fractured.

(c) *Recordkeeping.* The removal of flexible staybolt caps and other tests shall be reported on FRA Form No. 3. (See appendix B of this part.)

(d) *Testing at request of FRA inspector.* Staybolt caps also shall be removed, or any of the tests in this section made, whenever the FRA inspector or the steam locomotive owner and/or operator considers it necessary due to identifiable safety concerns about the condition of staybolts, staybolt caps or staybolt sleeves.

STEAM GAUGES

§ 230.42 Location of gauges.

Every boiler shall have at least one steam gauge which will correctly indicate the working pressure. The gauge shall be positioned so that it will be kept reasonably cool and can conveniently be read by the engine crew.

§ 230.43 Gauge siphon.

The steam gauge supply pipe shall have a siphon on it of ample capacity to prevent steam from entering the gauge. The supply pipe shall directly enter the boiler and be maintained